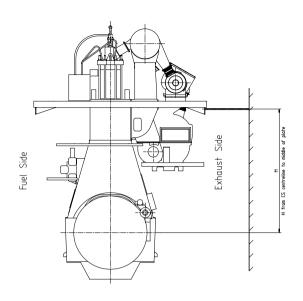
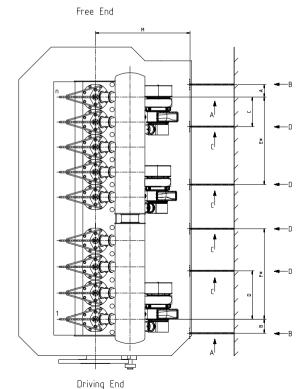
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Requirement for top t No. of Cyl.	6	7	8	9	10	11	12									
Lateral stays	B *1) / A *2)			A	A A	A	A A									
Longitudinal stays	С	C	С	С	С	С	С									
					•											
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tz) for extended rat	ing fields (n _{cmcr} \succeq	/o rbw)														
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												bace .	1	DIMENS		Q-Code
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Position of stay attachment points on engine / platform side (F) Turbocharger В D E× C Cyl. type 6 ON REQUEST 7 E 855 855 795 | 1301 6175 8175 8 2 x MET83MB E 2 x MET71MB 855 892 795 1412 6175 8175 (D) 3 x MET66MB 795 892 1579 1712 6175 8175 795 892 1879 1412 6175 8175 3 x MET66MB 10 3 x MET83MB 795 892 1879 1412 6175 8175

3 x MET83MB * Only for 11 and 12 cylinders.

3 x MET71MB

3 x MET71MB

Layout / specification of "inner" stay attachment points

795 892

795

795

892

1879 1412

F (1:10)

(c)

12

F View "D"

1879 1412 5565 4086 6175 8175

892 | 1879 | 3076 | 5565 | 5750 | 6175 | 8175

6175 8175



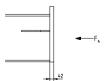


Max. permissible force in lateral direction	F,	(kN)	± 200
Stiffness	k	(N/m)	0.6 x 10°
Permissible vertical stays displacement	Def,	(mm)	± 50
Permissible horizontal stays displacement	Def,	(mm)	± 50
Permissible angular stays displacement	Def _a	(°)	2

Layout / specification of "outer" stay attachment points

View 'A' \bigcirc

F View "B" (1:10)





Max. permissible force in lateral direction	F,	(kN)	± 200
Stiffness	k	(N/m)	0.6 x 10°
Permissible vertical stays displacement	Def,	(mm)	± 50
Permissible horizontal stays displacement	Def,	(mm)	± 50
Permissible angular stays displacement	Def.	(°)	2

(c) Requirements for application of hydraulic stays on exhaust side

- The selected stays must have maker's acceptance for one side engine installation. WinGD approved supplier : Green & Clean Technology Co., Ltd (Korea) Hannii Hydraulic Machinery Co., Ltd (Korea) Nantong Navigation Machinery Group Co., Ltd (China)
- Installed on exhaust side (ES).
- The amount of stays must be determined based on the requirement and stays suppliers specification. The transferred forces must be taken into consideration.

The engine forces and moments are defined in the relevant engine dynamic data sheet "Forces and Moments" which is linked in the Marine Installation Manual (MIM). Stay pre-tensioning forces (max. piston hydraulic force) must also be considered and are provided by the stays supplier.

- The stay attachment point requirements must be crosschecked with the specification. The maximum forces transferred by the selected stays type must be within the range as defined on this drawing for standard engine execution. If the total force per stay exceeds the permissible range, reinforcement of the platform attachment points can be requested from the engine builder.
- The stays must adapt to the ship hull deformation and reduce the static reaction force acting on the engine and ship hull attachment points.
- The stays must increase the total stiffness of the system to avoid harmful resonance conditions. The dynamic stiffness of the stays (dynamic spring rate) is provided by the stays supplier.
- The stays must dampen accordingly to ensure that the acceptable vibrations (RMS limits) for the WinGD 2-stroke engine are met.
- The performance of the stays must be checked during sea trial by vibration measurements.
- Stay position in the vertical direction, respectively the distance to the bottom side of the upper platform beam must be arranged in a way that sufficient space for welding and application of the max. admissible stays inclination remains.
- The installation and commissioning of the stays must be in accordance with the supplier's instructions.

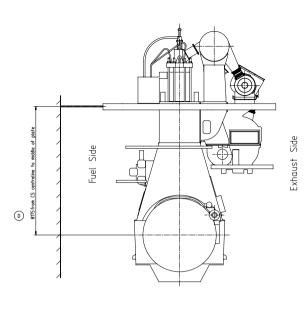
(c) Requirements on stays attachment points at ship hull side (per engine stay)

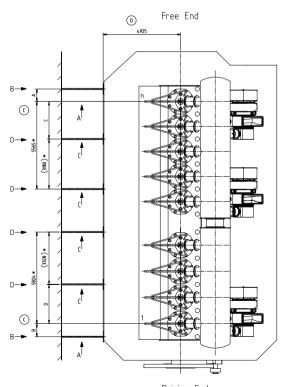
Max. force acting on ship's hull	Fh _{max}	(kN)	* 1)
Minimum stiffness	k _{min.}	(N/m)	0.5 x 10°
Permissible deflection per 100 kN	Def _{max}	(mm)	0.2

 \star 1) Maximum engine force resulting from lateral moments of X/H type at the project specific rating plus stays pre-tensioning force according to stays supplier's specification

> o Drawing Updated E jactifi ntu019 Ks04,2021 EAAD094596 Legacy information. See corresponding ChangeNotice 4 3
> D schill ntu019 30,09,2000 EAAD094971 Legacy information. See corresponding ChangeNotice 4 -- dxi021 mhu019 12.10.2018 ENGINE STAYS Stays location: ES WNGD 9715 0-Code XXXXX Standard WDS

PAAD296495 Pagets 1/1





Driving End

(A) * Only for 11 and 12 cylinders.

(c) Position of stay attachment points on engine / platform side

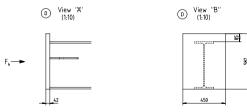
lo. of Cyl.	А	В	С	D								
6		ON DE	OLIECT									
7	ON REQUEST											
8	795	795	2385	2385								
9	795	832	2385	2496								
10	795	832	2385	2496								
11	795	832	2385	2496								
12	795	832	2385	2496								

Layout / Specification of "inner" stays platform attachment points

① View "C" ① View "D" (1:10)

	Max. permissible force in lateral direction	F,	(kN)	± 200
B	Stiffness	k	(N/m)	0.6 x 10°
	Permissible vertical stays displacement	Def,	(mm)	± 50
	Permissible horizontal stays displacement	Def,	(mm)	± 50
	Permissible angular stays displacement	Def.	(°)	2

Layout / Specification of "outer" stays platform attachment points



	Max. permissible force in lateral direction	F,	(kN)	± 200
$^{f B}$	Stiffness	k	(N/m)	0.6 x 10°
	Permissible vertical stays displacement	Def.	(mm)	± 50
	Permissible horizontal stays displacement	Def,	(mm)	± 50
	Permissible angular stays displacement	Def_	(°)	2

(B) Requirements for application of hydraulic stays on fuel side

- The selected stays must have maker's acceptance for one side engine installation.
 WinGD approved supplier : Green & Clean Technology Co., Ltd (Korea)
 Hanmi Hydraulic Machinery Co., Ltd (Korea)
 Nantong Navigation Machinery Group Co., Ltd (China)
- Installed on fuel side (FS).
- The amount of stays must be determined based on the requirement and stays suppliers specification. The transferred forces must be taken into consideration. The engine forces and moments are defined in the relevant engine dynamic data sheet "Forces and Moments" which is linked in the Marine Installation Manual (MIM). Stay pre-tensioning forces (max. piston hydraulic force) must also be considered and are provided by the stays supplier.
- The stay attachment point requirements must be crosschecked with the specification. The maximum forces transferred by the selected stays type must be within the range as defined on this drawing for standard engine execution. If the total force per stay exceeds the permissible range, reinforcement of the platform attachment points can be requested from the engine builder.
- The stays must adapt to the ship hull deformation and reduce the static reaction force acting on the engine and ship hull attachment points.
- The stays must increase the total stiffness of the system to avoid harmful resonance conditions. The dynamic stiffness of the stays (dynamic spring rate) is provided by the stays supplier.
- The stays must dampen accordingly to ensure that the acceptable vibrations (RMS limits) for the WinGD 2-stroke engine are met.
- The performance of the stays must be checked during sea trial by vibration measurements.
- Stay position in the vertical direction, respectively the distance to the bottom side of the upper platform beam must be arranged in a way that sufficient space for welding and application of the max. admissible stays inclination remains.
- The installation and commissioning of the stays must be in accordance with the supplier's instructions.

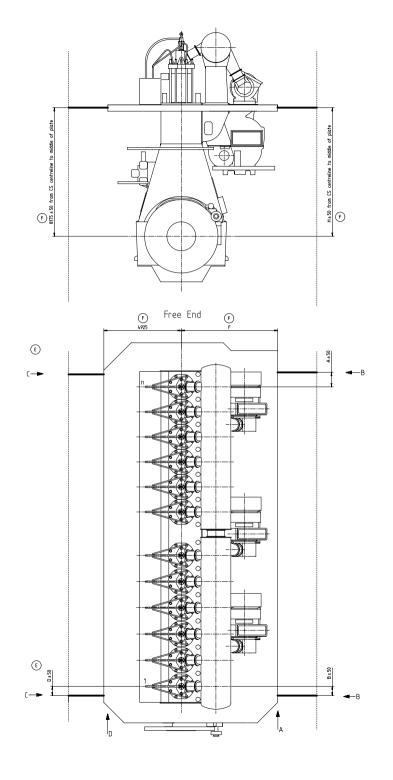
(B) Requirements on stays attachment points at ship hull side (per engine stay)

Max. force acting on ship's hull	Fh _{max}	(kN)	* 1)
Minimum stiffness	k _{min.}	(N/m)	0.5 x 10°
Permissible deflection per 100 kN	Def _{max}	(mm)	0.2

*1) Maximum engine force resulting from lateral moments of X/H type at the project specific rating plus stays pre-tensioning force according to stays supplier's specification

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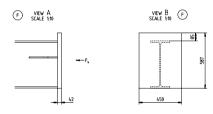
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Positions of stay attachment points on engine / platform side

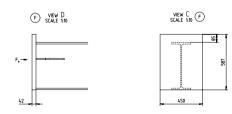
							F	Ð								
	No. of Cyl.	Turbocharger type	А	В	С	D	F	Н								
	6															
	7	ON REQUEST														
E	8	2 x MET83MB	855	855	795	795	6175	8175								
E	9	2 x MET71MB	855	892	795	832	6175	8175								
0		3 x MET66MB	795	892	795	832	6175	8175								
		3 x MET66MB	795	892	795	832	6175	8175								
	10	3 x MET83MB	795	892	795	832	6175	8175								
		3 x MET71MB	795	892	795	832	6175	8175								
	11	3 x MET71MB	795	892	795	832	6175	8175								
	12	3 x MET83MB	795	892	795	832	6175	8175								

Layout of stays attachment points on platform exhaust side according to WinGD standard design



Max. permissible force in lateral direction	F,	(kN)	± 200
Stiffness	k	(N/m)	0.6 x 10°
Permissible vertical stays displacement	Def,	(mm)	± 50
Permissible horizontal stays displacement	Def,	(mm)	± 50
Permissible angular stays displacement	Def_	(°)	2

Layout of stays attachment points on platform fuel side according to WinGD standard design



	Max. permissible force in lateral direction	F,	(kN)	± 200
0	Stiffness	k	(N/m)	0.6 x 10°
	Permissible vertical stays displacement	Def _v	(mm)	± 50
	Permissible horizontal stays displacement	Def,	(mm)	± 50
	Permissible angular stays displacement	Def _a	(°)	2

Requirements for application of hydraulic stays on fuel side AND exhaust side

- The selected stays must have maker's acceptance for both side engine installation. WinGD approved supplier: Green & Clean Technology Co., Ltd (Korea) Hanmi Hydraulic Machinery Co., Ltd (Korea) Nantong Navigation Machinery Group Co., Ltd (China)
- Installed on fuel side (FS) AND exhaust side (ES).

by the stays supplier.

- The amount of stays must be determined based on the requirement and stays suppliers specification. The transferred forces must be taken into consideration. The engine forces and moments are defined in the relevant engine dynamic data sheet "Forces and Moments" which is linked in the Marine Installation Manual (MIM). Stay pre-tensioning forces (max. piston hydraulic force) must also be considered and are provided
- The stay attachment point requirements must be crosschecked with the specification. The maximum forces transferred by the selected stays type must be within the range as defined on this drawing for standard engine execution. If the total force per stay exceeds the permissible range, reinforcement of the platform attachment points can be requested from the engine builder.
- The stays must adapt to the ship hull deformation and reduce the static reaction force acting on the engine and ship hull attachment points.
- The stays must increase the total stiffness of the system to avoid harmful resonance conditions. The dynamic stiffness of the stays (dynamic spring rate) is provided by the stays supolier.
- The stays must dampen accordingly to ensure that the acceptable vibrations (RMS limits) for the WinGD 2-stroke engine are met.
- The performance of the stays must be checked during sea trial by vibration measurements.
- The installation and commissioning of the stays must be in accordance with the supplier's instructions.
- (c) Requirements on stays attachment points at ship hull side (per engine stay)

Max. force acting on ship's hull	Fh _{max}	(kN)	× 1)
Minimum stiffness	k _{min.}	(N/m)	0.5 x 10°
Permissible deflection per 100 kN	Def _{max}	(mm)	0.2

*1) Maximum engine force resulting from lateral moments of X/H type at the project specific rating plus stays pre-tensioning force according to stays supplier's specification

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PAAD296501 Praying 1/1



MIDS - WinGD X92DF - Engine Stays (DG9715)

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2018-10-12	DRAWING SET	First web upload
2019-08-16	DAAD101549 DAAD101554 DAAD101557	Arrangement drgs – new revisions
2020-02-24	DAAD103623 DAAD101549 DAAD101557	Main and system drgs. – new revision
2020-08-26	DAAD101549 DAAD101554 DAAD101557	System drgs. – new revision
2020-10-01	DAAD103623 DAAD101549 DAAD101557	System drgs – new revision
2021-04-19	DAAD101549 DAAD101554 DAAD101557	System drgs – new revision
2021-01-20	PAAD296495 PAAD296499 PAAD296501	System drgs – new revision

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